



Update on BIS Dual Use Nuclear Controls and Licensing

presented by
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What Hasn't Changed

- ◉ Dual use export controls do not pose a significant barrier to civil nuclear trade throughout the world.
- ◉ Jurisdiction is usually well defined.
- ◉ Disputes are usually handled informally, many times with only a phone call or e-mail.



Agency Jurisdiction

Process	Agency	Jurisdiction	Advisory Agencies
Part 810	Department of Energy	Nuclear technology and services related to the production of Special Nuclear Material	Departments of Commerce, Defense, State, and the NRC
Part 110	Nuclear Regulatory Commission (NRC)	Nuclear equipment and material	Departments of Commerce, Defense, State, and Energy
Export Administration Regulations	Department of Commerce	Dual-use items listed on the Commerce Control List	Departments of Defense, Energy, and State



Commerce Jurisdiction (NSG dual-use items)



Pressure Transducers (2B230) - Used for pressure measurement in a multitude of industrial processes as well as in the uranium hexafluoride gas in the centrifuge process for isotope separation

Mass Spectrometers (3A233) - Determine composition of chemical samples as well as the chemical make-up of uranium, plutonium, etc.



Machine Tools (2B001) - Product manufacturing in virtually every industry including nuclear explosive device components and uranium enrichment equipment



Commerce Jurisdiction (nuclear power related items)

- Balance of plant – turbines, generators, switching gear, pipes and valves
- Health and safety equipment – radiation detection and monitoring, fire safety, facility security
- General infrastructure, telecommunications, tools and maintenance equipment
- Materials and Manufacturing Equipment

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Export Control Reform

Has limited impact on Dual Use nuclear exports

- ◉ Many items used in NPP are not controlled to most destinations
- ◉ NSG licensing requirements and exceptions not generally impacted by Export Control Reform
- ◉ License exception STA allows for NP items to go to Croatia, Estonia and Lithuania



Export Control Reform (cont'd)

Has limited impact on Dual Use nuclear exports

- ◉ End-Use Controls will still apply
- ◉ CCL Cat 0 Trigger List reference deleted
- ◉ ITAR Category XVI review to align DOE-DOS jurisdiction
- ◉ Specially designed definition will have minimal effect on dual use entries



Nuclear Licensing Requirements

- ◉ Section 744.2 restrictions may apply:
 - India Tarapur 1 & 2, Taiwan Kuosheng 1, PRC Qinshan (all safeguarded nuclear power plants) have the same licensing requirements
- ◉ NSG items require a license:
 - Certain NSG members such as the PRC, adherents, and all other non-members



End Use Restrictions Apply

- Section 744.2 (Catch-All /EPCI)
- Restricted end uses
 - Nuclear Explosive Activities
 - Unsafeguarded Nuclear Activities
 - Specific Nuclear Activities
 - Heavy Water Production, Isotope Separation....

§ 744.2 RESTRICTIONS ON CERTAIN NUCLEAR END-USES

(a) General prohibition

In addition to the license requirements for items specified on the CCL, you may not export, reexport, or transfer (in-country) to any destination, other than countries in Supplement No. 3 to this part, an item subject to the EAR, without a license if, at the time of export, reexport, or transfer (in-country) you know¹ that the item will be used directly or indirectly in any one or more of the following activities described in paragraphs (a)(1), (a)(2), and (a)(3) of this section:

(1) Nuclear explosive activities. Nuclear explosive activities, including research on or development, design, manufacture, construction, testing or maintenance of any nuclear explosive device, or components or subsystems of such a device.²

(2) Unsafeguarded nuclear activities.

Activities including research on, or development, design, manufacture, construction, operation, or maintenance of any nuclear reactor, critical facility, facility for the fabrication of nuclear fuel, facility for the conversion of nuclear material from one chemical form to another, or separate storage installation, where there is no obligation to accept International Atomic Energy Agency (IAEA) safeguards at the relevant facility or installation when it contains any source or special fissionable material (regardless of whether or not it contains such material at the time of export), or where any such obligation is not met.

(3) Safeguarded and unsafeguarded nuclear activities. Safeguarded and unsafeguarded nuclear fuel cycle activities, including research on or development, design, manufacture, construction, operation or maintenance of any of the following facilities, or components for such facilities.³

(i) Facilities for the chemical processing of irradiated special nuclear or source material;

(ii) Facilities for the production of heavy water;

(iii) Facilities for the separation of isotopes of source and special nuclear material; or

(iv) Facilities for the fabrication of nuclear reactor fuel containing plutonium.



Not every firm involved in 744.2 activities is on the Entity List.

COUNTRY	ENTITY	LICENSE REQUIREMENT	LICENSE REVIEW POLICY	FEDERAL REGISTER CITATION
PAKISTAN	<p>Pakistan Atomic Energy Commission (PAEC), a.k.a., the following alias:</p> <ul style="list-style-type: none"> -Power Plant Workshops, <p>P.O. Box 1114, Islamabad;</p> <p>and the following three subordinate entities:</p> <ul style="list-style-type: none"> -National Development Complex (NDC), a.k.a., the following two aliases: <ul style="list-style-type: none"> -National Development Centre; and -National Defense Complex, Fateh Jang, Punjab, Rawalpindi, Pakistan; and P.O. Box 2216, Islamabad, Pakistan, -Pakistan Institute for Nuclear Science and Technology (PINSTECH), Nilore, Islamabad; -Nuclear reactors (including power plants), fuel reprocessing and enrichment facilities, all uranium processing, conversion and enrichment facilities, heavy water production facilities and any collocated ammonia plants. 	For all items subject to the EAR.	Case-by-case for all items listed on the CCL. Presumption of approval for EAR99 items.	63 FR 64322, 11/19/98, 65 FR 14444, 03/17/00, 66 FR 50090, 10/01/01, 77 FR 58006, 9/19/12.



India and China

- ◉ Exports to IAEA safeguarded or “commercial” nuclear power plants are routinely approved or returned without action.
- ◉ Exports of equipment or materials to produce items for the civil nuclear power industry routinely approved.
- ◉ Nuclear centers or laboratories do more than commercial power!



India and China

- ◉ Review Section 744.2 of the EAR and the Entity List (Supplement 4 to Part 744 of the EAR)
- ◉ If a license is required, transparency is the key:
 - Clearly state name of the consignee or end users, with accurate address and contact information
 - Provide detailed information of nuclear activities at the facility
 - Provide safeguard status if known
 - Provide thorough descriptions of the item that details the appropriateness of the export for the stated end use



Nuclear Suppliers Group Updates

- Mexico and Serbia are the newest members



- Review of the Dual Use List has led to several updates to be included on the CCL



NSG Dual Use List Changes

Pressure Transducers (2B230)

- Addition of pressure transducers with sensing elements made of or protected by alumina, sapphire, or fully fluorinated hydrocarbon polymers
- Any seals present must also be made of chemically resistant materials
- Clarification of when accuracy measurement is applied





NSG Dual Use List Changes

Bellows-sealed scroll-type compressors and bellows-sealed scroll-type vacuum pumps (new ECCN)

- Inlet volume flow rate of 50 m³/h or greater
- Pressure ratio of 2:1 or greater
- Wetted surfaces of the following materials: aluminum, aluminum alloy, aluminum oxide, stainless steel, nickel, nickel alloy, phosphor bronze, or fluoropolymers



NSG Dual Use List Changes

Rhenium, and alloys containing 90% by weight or more rhenium, and alloys of rhenium and tungsten containing 90% by weight or more of any combination of rhenium and tungsten (new ECCN)

- Hollow cylinders with an inside diameter between 100 and 300 mm and
- Mass greater than 20kg

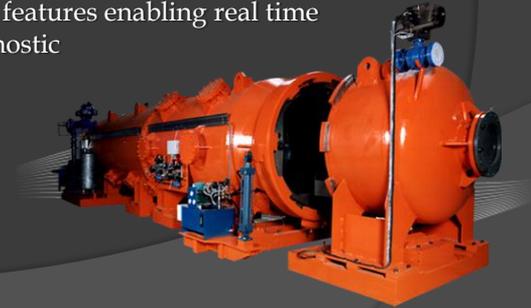




NSG Dual Use List Changes

High explosive containment vessels, chambers and containers designed for the testing of high explosives (new ECCN)

- Designed to fully contain an explosion equivalent to 2 kg of TNT or greater and
- Having design elements or features enabling real time or delayed transfer of diagnostic or measurement information



NSG Dual Use List Changes

Items removed include

- Ammonia synthesis converters or synthesis units

Other changes made to entries include

- Changes to the dimensional capabilities of filament winding machines
- Decrease in ultimate tensile strength capability of maraging steel
- Removed upper frequency and harmonic distortion requirement from frequency changers
- Mass spectrometer entry updated





Remaining Issues from the NSG Annex Review

- Rewrite of machine tool controls and coordination with the Wassenaar Arrangement



- Small quantity exports



Small Quantity Exports

Export of small quantities of NSG controlled Dual-Use materials

- Represents a large licensing burden
- Disproportionate to the proliferation concern, which is negligible for these small quantities
- Often the cost of submitting and processing licenses is larger than the cost of the material
- Possible NSG solution to include a small quantity exclusion for several materials



Nickel Powder



Average dollar value per license	
≤ 100g	\$76
>100g, but ≤ 1 kg	\$281
>1 kg, but ≤ 10 kg	\$1,918
>10 kg	\$534,395

1998 through May 2012*
(100% approval, 243 licenses issued)

*due to volume, only data from 2008 onward is represented graphically



Between May 1, 2012 and April 30, 2013, the United States has approved...

- 8 licenses for calcium
100% approval, 100% for 30 grams or less
- 18 licenses for magnesium
100% approval, 33% for 100 grams or less, 78% for 1 kg or less
- 18 licenses for bismuth
100% approval, 78% for 100 grams or less, 94% for 1 kg or less
- 22 licenses for beryllium
1 denial (not NP concern), 27% for 100 grams or less, 63% for 1 kg or less
- 57 licenses for zirconium
100% approval, 32% for 100 grams or less, 58% for 1 kg or less
- 26 licenses for nickel
100% approval, 38% for 100 grams or less, 62% for 1 kg or less



Deemed Export Rule

- The obligation to determine whether a license is required before releasing controlled technology or source code to a foreign national is informally referred to as the “deemed export” rule.
- The release of controlled technology or source code to a foreign national in the U.S. is “deemed” to be an export to the home country or countries of the foreign national.



Nationality

- Commerce Department looks to a foreign national's most recent country of citizenship or permanent residence
- Exempted from the deemed export rule:
 - A person granted U.S. citizenship
 - A person granted permanent residence status in the U.S. (i.e. “Green Card” holders)
 - A person granted status as a “protected individual” under 8 U.S.C. 1324b(a)(3)





Part 6 of Form I-129: Export Certification Requirement

Part 6. Certification Regarding the Release of Controlled Technology or Technical Data to Foreign Persons in the United States

(For H-1B, H-1B1 Chile/Singapore, L-1, and O-1A petitions only. This section of the form is not required for all other classifications. See Page 3 of the Instructions before completing this section.)

Check Box 1 or Box 2 as appropriate:

With respect to the technology or technical data the petitioner will release or otherwise provide access to the beneficiary, the petitioner certifies that it has reviewed the Export Administration Regulations (EAR) and the International Traffic in Arms Regulations (ITAR) and has determined that:

- 1. A license is not required from either U.S. Department of Commerce or the U.S. Department of State to release such technology or technical data to the foreign person; or
- 2. A license is required from the U.S. Department of Commerce and/or the U.S. Department of State to release such technology or technical data to the beneficiary and the petitioner will prevent access to the controlled technology or technical data by the beneficiary until and unless the petitioner has received the required license or other authorization to release it to the beneficiary.



Deemed Exports and I-129 – How much of an issue?

- What if I am a nuclear power plant operator?
- What if I am a valve manufacturer?
- Are Chinese or Indian nationals possible?



Questions?

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Multilateral Supplier Policy Program & Global Regimes Program



Office of
**Nonproliferation
and International
Security (NIS)**

-  **Safeguard and Secure** nuclear material to prevent its diversion, theft and sabotage.
-  **Control** the spread of WMD-related material, equipment, technology and expertise.
-  Negotiate, monitor and **verify** compliance with international nonproliferation and arms control treaties and agreements.
-  Develop and implement DOE/NNSA nonproliferation and arms control policy to reduce the risk of weapons of mass destruction.

Richard Goorevich
Senior Policy Advisor

- This briefing provides an overview of work covered by the U.S. Department of Energy/ National Nuclear Security Administration's (DOE/NNSA) Office of Nonproliferation and International Security (NIS):
 - Part 810s;
 - Section 123 Agreements;
 - The Zangger Committee; and
 - The Nuclear Suppliers Group.

- **The USG has a three part nuclear export system of licensing for nuclear related assistance and items.**
- **Three entities administer these controls.**
 - **Department of Energy:** through 10 CFR Part 810, controls technology and assistance
 - **Nuclear Regulatory Commission:** through 10 CFR Part 110, controls major components and nuclear material
 - **Department of Commerce:** through the Export Administration Regulation, controls dual use items

Part 810: Statutory Basis

- **Section 57 b. of the 1954 Atomic Energy Act established law and U.S. policy for the control and use of atomic energy for peaceful purposes**
 - Legal basis for 10 CFR Part 810, which empowers the Secretary of Energy to authorize such cooperation on a case by case basis.
 - Prohibits U.S. persons from directly or indirectly engaging in the production of special nuclear material (SNM) outside the United States
- **Section 57 b. was substantially altered by the 1978 NNPA**
 - Specific language was added to 57 b. that laid out the process for an applicant that we use in Part 810 today
 - This included the requirement that the Secretary of Energy receive the concurrence of the Department of State, and consult with the Nuclear Regulatory Commission, and the Departments of Defense and Commerce prior to making the non-inimicality determination.

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Part 810: Key Principles

- All assistance in production of SNM is prohibited
... *Unless authorized by the Secretary of Energy after determining the assistance is not inimical to the interest of the United States*
- **The Secretary can generally authorize some activities and transactions to certain countries.**
 - Non-sensitive aspects of the fuel-cycle with major trading partners (except China, Russia, India); and
 - Transactions authorized by NRC, public information.
- **Some activities always require specific authorization.**
 - Transfer of enrichment, reprocessing, and plutonium bearing fuel technologies; and
 - Trade with countries on restricted list (embargoed, non-NPT, national security concerns).

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Part 810: Proposed Regulations

- **Initial proposed rulemaking (2011)**
 - Meant to address concerns about outdated regulations that were last revised in 1986.
- **Supplemental proposed rulemaking**
 - Draft regulations were revised together with interested agencies to respond to comments received
- **Goal of new Part 810 regulations:**
 - **Effective threat reduction.** Maintain effective controls in the face of changing nuclear geopolitics, economics, technologies and relationships
 - **Effective nuclear trade support.** Support U.S. companies competing to provide nuclear technology for peaceful purposes
 - **Efficient regulation.** Create a licensing process that is efficient, transparent, timely, and predictable. The cost of regulation should not exceed the benefits. Avoid duplicative or unnecessary regulatory requirements.

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123 Agreements: DOE/NNSA role

- Section 123 of the 1954 Atomic Energy Act (AEA) requires the U.S. Government to enter into an agreement for cooperation whenever it seeks to engage in civil nuclear cooperation with any nation or group of nations.
- The AEA requires any proposed agreement for cooperation to be negotiated by the Secretary of State, with the **technical assistance and concurrence of the Secretary of Energy** and after consultation with the Commission shall be submitted to the President **jointly by the Secretary of State and the Secretary of Energy.**
 - State and DOE also work closely with the Nuclear Regulatory Commission on material accountancy issues and regularly consult with National Security Staff in the development of concepts and approaches in the negotiation and implementation of 123 Agreements.

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123 Agreements: Requirements

- **The AEA requires all 123 Agreements to contain certain nonproliferation requirements:**
 - Safeguards over all material and equipment transferred and all produced material;
 - In NNWS, IAEA full-scope safeguards;
 - Peaceful use assurances;
 - U.S. right of return;
 - No retransfer without prior U.S. consent;
 - Adequate physical security;
 - No enrichment, reprocessing or alteration in form or content without prior U.S. consent;
 - U.S. consent over storage facilities holding HEU, Pu, and U-233; and
 - Special conditions whenever a 123 Agreement allows for the transfer of sensitive nuclear technology.

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123 Agreements: Administrative Arrangements

- **Administrative Arrangements to 123 Agreements are politically binding agreements that clarify the implementation of 123 Agreements.**
- **DOE/NNSA leads in the negotiation and implementation of such Agreements.**
 - Annual inventory reports.
 - Provisions for the tracking on transfers of nuclear material subject to Agreements.
- **Administrative Arrangements in force with Australia, Canada, EURATOM, Japan, Russia, and Switzerland.**

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123 Agreements: Subsequent Arrangements

- **Section 131 of the AEA requires U.S. approval for partner countries to perform certain activities under 123 Agreements.**
 - Contracts for the furnishing of nuclear materials and equipment;
 - Approvals for the transfer, for which prior approval is required under an agreement for cooperation, by a recipient of any source or special nuclear material, production or utilization facility, or nuclear technology;
 - Authorization for the distribution of nuclear materials and equipment pursuant to this Act which is not subject to the procedures set forth in section 111b., section 126, or section 109b.;
 - Arrangements for physical security;
 - Arrangements for the storage or disposition of irradiated fuel elements;
 - Arrangements for the application of safeguards with respect to nuclear materials and equipment; or
 - Any other arrangement which the President finds to be important from the standpoint of preventing proliferation.

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123 Agreements: Subsequent Arrangements (cont)

- **Secretary of Energy must make a general finding that the issuance of subsequent arrangements is not inimical to the common defense and security of the United States.**
- **In certain instances, the Secretary of Energy must make further legal determinations.**
 - Must consider whether a subsequent arrangement ***might significantly contribute to proliferation.***
 - When dealing with reprocessing, the Secretary must determine that the proposed subsequent arrangement ***will not result in a significant increase of the risk of proliferation beyond that which exists at the time that approval is requested.***
 - In this regard, the Secretary must consider ***whether or not the reprocessing or retransfer will take place under conditions that will ensure timely warning to the United States of any diversion well in advance of the time at which the non-nuclear-weapon state could transform the diverted material into a nuclear explosive device.***

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Nuclear Suppliers Group

- **The Nuclear Suppliers Group (NSG) is a group of nuclear supplier states that seek to contribute to the nonproliferation of nuclear weapons through the implementation of two sets of Guidelines for nuclear exports and nuclear-related exports.**
 - The NSG, originally known as the London Club, first met after India's peaceful nuclear explosion in May 1974.
- **The NSG Guidelines are not an internationally legally-binding agreement; however, it is a collective policy agreement.**
- **Membership:**
 - There are currently 48 Participating Governments.
 - Other membership issues:
 - No official connection between the NSG and the IAEA.
 - European Commission attends all NSG meetings as a permanent observer.

Nuclear Suppliers Group: Trigger List

- **Part 1 of the NSG Guidelines contains a Trigger List that is illustrative of commodities “especially designed or prepared” for the processing, use, or production of special fissionable material.**
- **The Trigger List prohibits the export of commodities and related technology:**
 - to any non-nuclear weapons state that does not have a legally binding commitment for full scope safeguards with the IAEA; or
 - if the exporting country is not satisfied that the export will be used for peaceful purposes
- **Three exceptions to the prohibitions of Part 1:**
 - export is deemed essential for the safe operation of an existing safeguarded facility (must be an *Imminent Radiological Danger*)
 - export is under the “grandfather” provisions (April 3, 1992 for original members and time of membership of subsequent members)
 - transfer is destined to a safeguarded facility in India; policy decision published as INFICRC/734, as corrected.

Nuclear Suppliers Group: Dual-Use list

- **Part 2 of the NSG Guidelines contains a list of nuclear related dual-use equipment, materials and related technologies.**
- **Part 2 of the NSG Guidelines prohibit the export of controlled commodities and technologies:**
 - to any non-nuclear weapons state for use in nuclear explosive activity, or in an unsafeguarded nuclear fuel-cycle facility;
 - when there is an unacceptable risk of diversion, or if the export would be contrary to nonproliferation objectives; or
 - if there is a risk of diversion to terrorist acts.
- **There are no exceptions to the prohibitions of Part 2.**

NIS work

- **The Multilateral Supplier Policy Program helps strengthen the global nonproliferation regime through two program areas:**
 - ***Multilateral Regime Support***
 - Provide technical and policy expertise to help negotiate U.S. interests and positions in the Nuclear Suppliers Group (NSG), and the Zangger Committee
 - Overall U.S. technical lead during supplier regime meetings
 - Contribute to strengthening and updating the supplier regimes' guidelines, control lists, and operations in line with U.S. national security and foreign policy objectives
 - ***Multilateral Nuclear Export Technical Studies***
 - DOE National Laboratories conduct Technical Studies to develop new approaches to solve existing or evolving proliferation problems
 - Projects results are used to raise the awareness of decision makers in the U.S. Government and the international community to prevent and counter the efforts of known and would-be proliferators

Nuclear Suppliers Group: NIS work

- Working together with the U.S. interagency (State, NRC, DoD, Commerce), NNSA has helped the group accomplish the following:
 - Introduction of a “catch-all” mechanism in the NSG Dual-Use Guidelines
 - Led efforts to update the export control parameters and technical notes for advanced machine tool measurement and inspection machines
 - Led efforts to establish Terms of Reference for the Fundamental Review of the NSG Control Lists and updated the NSG’s Trigger and Dual-Use lists;
 - Completed negotiations to strengthen NSG Guidelines on enrichment and reprocessing;
 - Developed national “procurement watch lists” to stem the proliferation of nuclear items that fall below NSG Control List thresholds and updated multilateral control lists with “lessons learned” from illicit and clandestine procurement attempts;
 - Conducted outreach to nonparticipating governments to create awareness on issues related to the supply of sensitive technology and press for adherence to the NSG Guidelines; and
 - Maintain the NSG Information Sharing System (NISS) and the NISS Forum (website that supports the Fundamental Review)
 - Used NSG and Zanger Committee (ZC) meetings as forums to urge support for U.S. Government initiatives, including those aimed at shuttering illicit networks.

Nuclear Suppliers Group: 2013 Prague Plenary

- **Completion of the Fundamental Review of the NSG Trigger and Dual-Use Lists**
 - **A revised INFCIRC/254 will be published. In the interim, changes accepted in Prague will be added to those already posted on the NSG website.**
 - **A total of 54 changes were accepted by NSG Participating Governments.**
 - *26 changes accepted at the 2012 Seattle Plenary*

➤ Shut-off and control valves	➤ Ammonia synthesis converters
➤ Frequency changers	➤ Hydrogen-cryogenic distillation columns
➤ Pulsed carbon monoxide lasers	➤ Pressure transducers
➤ Active magnetic bearing EDP for gas centrifuges	➤ Nuclear reactor internals
➤ Copper vapor lasers	➤ Nuclear reactor vessels
➤ Bellows-sealed scroll-type compressors/pumps	➤ Nuclear reactor pressure tubes
➤ Maraging steel	➤ Nuclear fuel cladding
➤ Filament winding machines	➤ Primary coolant pumps
➤ Lithium isotope separation facilities or plants	➤ Heat exchangers
➤ Water hydrogen sulphide exchange towers	➤ Nuclear grade graphite
	➤ Complete nuclear reactors
	➤ Primary coolant pumps
	➤ Nuclear reactor internals
	➤ Neutron detection and measuring instruments

Nuclear Suppliers Group: 2013 Prague Plenary

- *28 accepted at the 2013 Prague Plenary*
 - Velocity interferometers
 - Firing sets
 - Striplines for detonators
 - Ytterbium gauges
 - Plugins for high-speed cameras
 - High velocity gas gun systems
 - Explosion proof confinement vessels
 - Alpha radionuclides
 - Rhenium
 - High explosive substances or mixtures
 - Neutron generators
 - High-speed cameras
 - High-speed pulse generators
 - Crucible materials
 - EDP entries on reprocessing trigger list
 - Neutron measurement system for reprocessing
 - Software in Part 1
 - Dimensional inspection machines
 - Remove references to the VDI/VDE 2617 Standard
 - Mass spectrometers
 - Stable isotope separation
 - Application of technology controls and the associated definition of "use"

Nuclear Suppliers Group: 2013 Prague Plenary cont...

- Consensus on the Terms of Reference for a new Technical Experts Group to continue the review of the control lists as needed under the guidance of the CG
- Approved the update of Part 1 paragraph 3(a) and Annex C to reflect IAEA physical protection recommendations, specifically mentioning INFCIRC/225.
- Australia, Canada, Finland, Germany, Japan and the United States co-sponsored UK paper on industry engagement, which will to be posted on the new NSG public website
- PGs agreed to have the NSG Point of Contact add a chronological list of NSG decisions in the Procedural Arrangement to assist with implementation
- Serbia joined the 2013 Prague Plenary as a NSG Participating Government



Introduction to NRC Export/Import Licensing – 10 CFR Part 110

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Export Controls and International Organizations Branch
Office of International Programs

July 23, 2013



Legal Basis

- ▶ Atomic Energy Act of 1954
- ▶ Nuclear Non–Proliferation Act of 1978
- ▶ Treaties, Conventions and Agreements including:
 - Nuclear Non–Proliferation Treaty
 - International Atomic Energy Agency (IAEA) Safeguards
 - Conventions: Nuclear Safety; Waste and Spent Fuel; Physical Protection; Early Notification; Assistance; and Liability
 - 123 Agreements for peaceful nuclear cooperation

NRC Jurisdiction

- ▶ Exports: reactors; fuel cycle facilities; components; nuclear grade graphite for nuclear end use; deuterium; source, special nuclear and byproduct materials including when contained in spent fuel or radioactive waste
- ▶ Imports: reactors; fuel cycle facilities; source, special nuclear and byproduct materials including when contained in spent fuel or radioactive waste

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If Subject to NRC Jurisdiction

- ▶ All exports and imports of NRC-controlled commodities (materials and equipment) must be authorized by either:
 - An NRC **general** export or import license or
 - An NRC **specific** export or import license or
 - An exemption from NRC requirements for a specific or a general license which may be granted in response to an application requesting an exemption or issued on NRC's initiative

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NRC General Licenses

- ▶ Are issued in 10 CFR 110 after rulemaking and coordination with the Executive Branch
- ▶ Are not exemptions (or NLRs)
- ▶ Authorize exports (10 CFR 110.21–110.26) of small quantities of uranium, plutonium, tritium and minor reactor components to specified countries
- ▶ Authorize imports (10 CFR 110.27) of major reactor components, source, special nuclear and/or byproduct materials to authorized recipients
- ▶ Require record keeping and, for certain exports, filing annual reports to the NRC

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NRC General Licenses

- ▶ Do not authorize exports to embargoed countries, i.e., a specific license is required for exports to:

Cuba	Iran	Iraq	North Korea
Syria	Sudan		
- ▶ Authorize limited exports to restricted destinations – a specific license may be required:

Afghanistan	Andorra	Angola	Burma
Djibouti	India	Israel	Libya
Pakistan	South Sudan		

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NRC Specific Licenses – Review Process

- ▶ All NRC Form 7 applications made public in ADAMS
- ▶ Some require Federal Register notices
- ▶ Interested parties have up to ~30 days to respond
- ▶ Processing fee ranging from \$1,400 to \$17,700 depends on level of review required (proliferation significance of commodity)
 - Most require interacting with foreign governments and some form of NRC Program Office review
 - Some require review by interested Executive Branch agencies, coordinated by Department of State
 - Some require review and approval by Commissioners

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Applications for NRC Specific Licenses

- ▶ Are assigned a docket number (1100XXXX) and one of the following prefixes:
 - XSNM = export of special nuclear material
 - XSOU = export of source material
 - XMAT = export of material (i.e., deuterium)
 - XB = export of byproduct material (Appendix L)
 - XR = export of reactor (or major components)
 - XCOM = export of minor components
 - XW = export of radioactive waste
 - IW = import of radioactive waste

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Criteria for “Major” Exports (XSNM, XSOU, XR)

- ▶ Agreement for Cooperation (123 Agreement)
- ▶ Full-scope IAEA safeguards in recipient non-nuclear weapon states (NNWS)
- ▶ USG must obtain assurances from the foreign government on case-by-case basis that material or equipment will be made subject to 123 Agreement with respect to:
 - No nuclear explosive use or R&D on any nuclear explosive device
 - Adequate physical security will be maintained
 - No retransfer or alteration in form (reprocessing) without prior USG consent
- ▶ Not inimical to common defense and security
- ▶ For XR, not an unreasonable risk to the public health and safety of the U.S.

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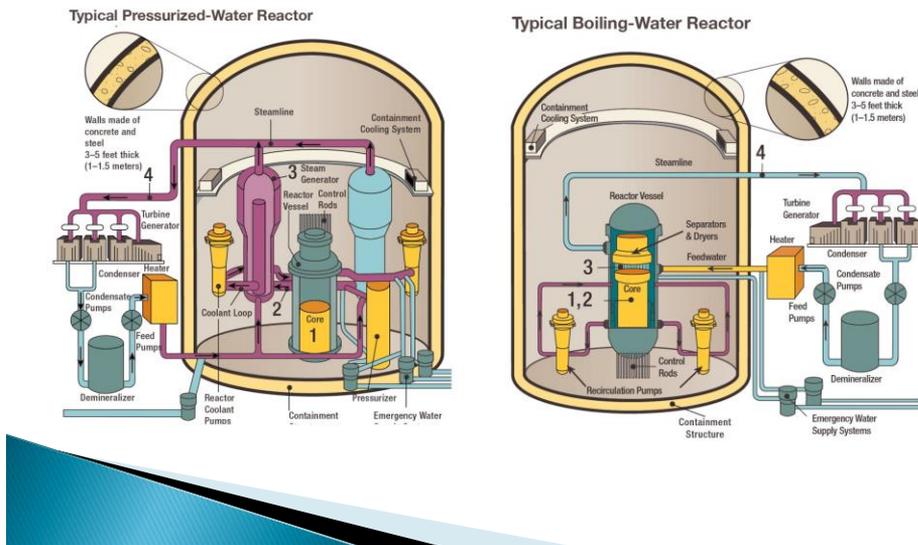


Criteria for “Minor” Exports (XCOM, XMAT)

- ▶ USG must obtain assurances from the foreign government on case-by-case basis that:
 - IAEA (full-scope) safeguards will apply in NNWS
 - No nuclear explosive use or R&D on such device
 - No retransfer without prior USG consent
- ▶ Not inimical to common defense and security

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Nuclear Reactors & Especially Designed or Prepared Equipment



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Part 110 Appendix A Illustrative List of Reactor Equipment

- ▶ Especially Designed or Prepared Equipment
- ▶ Definition of “Nuclear Reactor:”
 - Items within or attached directly to the reactor vessel
 - Equipment which controls the level of power in the core
 - Components which normally contain or come in direct with or control the primary coolant of the reactor core

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Part 110 Appendix A “Major” Reactor Equipment

- ▶ Reactor pressure vessels, i.e., metal vessels, as complete units or major shop-fabricated parts
- ▶ On-line reactor fuel charging and discharging machines
- ▶ Complete control rod drive system
- ▶ Reactor primary coolant pumps



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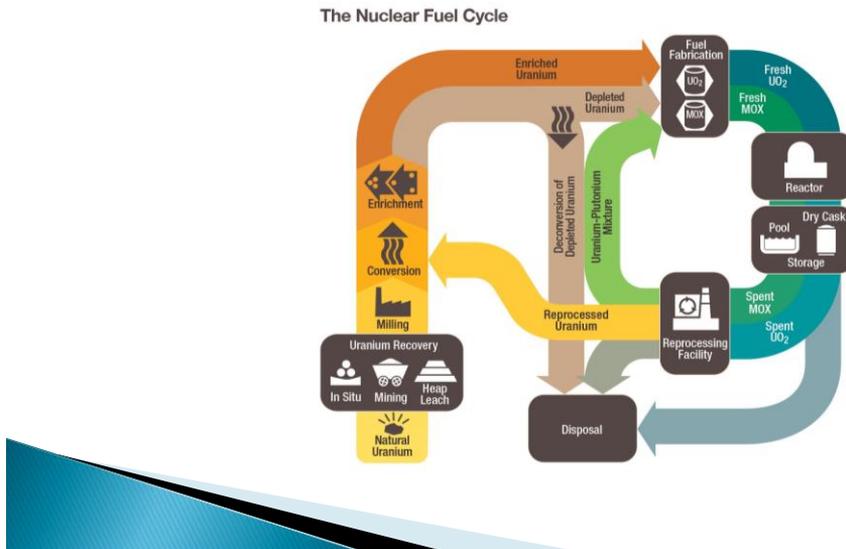
Part 110 Appendix A “Minor” Reactor Equipment

- ▶ Reactor pressure tubes, i.e., tubes especially designed or prepared to contain fuel elements and the primary coolant
- ▶ Zirconium tubes
- ▶ Reactor internals, .e.g., core support structures, control and rod guide tubes, thermal shields, baffles, core grid plates and diffuser plates
- ▶ Reactor control rod drive mechanisms, including detection and measuring equipment to determine flux levels
- ▶ Any other components *especially designed or prepared* for use in a nuclear reactor or in any of the components described



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Fuel Cycle Facilities & Especially Designed or Prepared Components



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Illustrative Lists in Part 110 Appendices

- ▶ Appendix B – Gas Centrifuge Enrichment
- ▶ Appendix C – Gaseous Diffusion Enrichment
- ▶ Appendix D – Aerodynamic Enrichment
- ▶ Appendix E – Chemical or Ion Exchange Enrichment
- ▶ Appendix F – Laser-Based Enrichment
- ▶ Appendix G – Plasma Separation Enrichment
- ▶ Appendix H – Electromagnetic Enrichment
- ▶ Appendix I – Reprocessing
- ▶ Appendix J – Uranium Conversion
- ▶ Appendix K – Plants for the Production of Heavy Water, Deuterium and Deuterium Compounds
- ▶ Appendix N – Lithium Isotope Separation
- ▶ Appendix O – Fuel Fabrication

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Part 110 Appendix P Radioactive Materials

- ▶ In 2005, Part 110 was amended to address the IAEA Code of Conduct on the Safety and Security of Radioactive Sources and its Import/ Export Guidance
- ▶ 16 radionuclides previously authorized for export or import under general license became subject to specific licensing
- ▶ In 2010, Part 110 was amended to allow U.S. parties to import under general license if they are appropriately authorized domestically

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Part 110 Appendix P Radioactive Materials

- ▶ If a device or a source for use in a device contains Appendix P radionuclides (Am-241, Am-241/Be, Cf-252, Cm-244, Co-60, Cs-137, Gd-153, Ir-192, Pu-238, Pu-239/Be, Pm-147, Ra-226, Se-75, Sr-90, Tm-170 or Yb-169) a specific NRC export license may be required



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What's Next for Part 110?

- ▶ Nuclear Suppliers Group completed its review of the Part 1 and Part 2 control lists
 - NRC will update several Appendices to Part 110 to make conforming changes
- ▶ IAEA INFCIRC/225/Revision 5 – Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities



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To contact the NRC
Office of International
Programs

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THANK YOU!!!

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